CLAIMS

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1. A device for measuring the temperature of a molten metal, said device comprising a thermocouple element, a housing comprised of a heat-resistant material, and a retainer member for receiving the thermocouple element, said retainer member having an open end and a closed end, said thermocouple element having a hot junction located proximate said closed end of said retainer member, said retainer member being positioned within said housing and being smaller in size than said housing to define a cavity therebetween, said cavity being substantially filled by a protective material comprising a metal oxide component and an oxygen reducing component.

2. A device according to claim 1, wherein said heat-resistant material comprises a metal oxide and graphite.

3. A device according to claim 2, wherein said metal oxide of said heat-resistant material is aluminum oxide.

4. A device according to claim 1, wherein said retainer member is ceramic.

5. A device according to claim 1, wherein said retainer member is generally tubular.

6. A device according to claim 1, wherein said metal oxide component of said protective material is selected from the group consisting of aluminum oxide, magnesium oxide, manganese oxide, titanium oxide, vanadium oxide, zirconium oxide, and mixtures thereof.

7. A device according to claim 1, wherein said metal oxide component of said protective material is aluminum oxide.

8. A device according to claim 1, wherein said metal oxide component of said protective material is a powder.

9. A device according to claim 1, wherein said oxygen reducing component is selected from the group consisting of aluminum, magnesium, manganese, titanium, vanadium, zirconium, and mixtures thereof.

10. A device according to claim 1, wherein said oxygen reducing component is aluminum.

11. A device according to claim 10, wherein said aluminum comprises about 15% to about 70% by volume of said protective material.

12. A device according to claim 10, wherein said aluminum comprises about 25% to about 65% by volume of said protective material.

13. A device according to claim 1, wherein said oxygen reducing component comprises about 5% to about 95% by volume of said protective material.

14. A device according to claim 1, wherein said oxygen reducing component is selected from the group consisting of powder, granules, and mixtures thereof.

15. A device according to claim 1, wherein said oxygen reducing component is embedded in said metal oxide component of said protective material, said oxygen reducing component being selected from the group consisting of wires, pellets, grains, and mixtures thereof.

16. A device according to claim 1, wherein said oxygen reducing component is selected from the group consisting of rods, ribbons, wire wrap, and mixtures thereof.

17. A device according to claim 16, wherein said oxygen reducing component comprises a plurality of rods, said rods being generally parallel to a longitudinal axis of said retainer member.

18. A device according to claim 1, wherein said oxygen reducing component is a sleeve which at least partially encompasses said metal oxide component of said protective material.

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